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BACKGROUND STATEMENT ON SOYBEANS

Soybeans are a real war crop. More than any other farm product, perhaps, they have taken on new significance in the United States as food, as a source of valuable commercial products and as a maker of weapons of war.

Probably the oldest legume cultivated by man, the soybean's origin is so remote it is known only through legend. Earliest writing containing reference to it was at the time of the building of the pyramids.

Brought to Europe from the Orient in 1712 by a German botanist, soybeans entered America in 1804 on a Yankee Clipper as part of a reserve food supply. But it was not until World War I that they achieved notice. They were first crushed in the United States for oil in 1915, but by 1918 soybean oil imports amounted to 336 million pounds. Little effort was made to develop soybeans as a primary farm crop, although their many uses were gradually being realized. It took World War II to provide the necessary impetus.

The United States grew 9 million bushels of soybeans in 1929, increased this to 91 million bushels 10 years later and to nearly 107 million bushels in 1941. The 1942 harvest of 14,222,000 acres of soybeans grown alone for all purposes produced an estimated 209,559,000 bushels. Estimated production this year has not been computed, but the acreage of soybeans grown alone for 1943 was estimated in the July 1 Crop Report at 15,434,000 acres. This is an increase of 1,200,000 acres over 1942, or 8.5 percent, and follows an increase of 40.2 percent in 1942 over 1941.

Chief Producing States

In the North Central States, which have 77 percent of the total acreage, the increase this year of 6 percent in acreage follows a 49 percent increase in 1942 over the previous year. Plantings total about 9,750,000 acres. In Michigan, Wisconsin, and Minnesota, where frosts caught many soybeans in the fall of 1942, plantings were cut sharply this year. In all other states except New York, acreage was increased. The present estimate is about 1 percent less

than the March, 1943 prospective plantings. Illinois, leading soybean state, shows a 7 percent increase in acreage over last year. In Iowa, the increase is 5 percent; in Indiana, 4 and in Ohio, 11 percent.

Stocks of soybeans on farms on July 1 totalled 13,952,000 bushels, compared with April 1 holdings of 57,610,000 bushels. The disappearance from farms between April 1 and July 1 of $43\frac{1}{2}$ million bushels includes seed and beans fed to live-stock, as well as movement into commercial channels. Of the July 1 farm stocks, 13 million bushels are in the 10 principal soybean-producing states.

Largest soybean producers are Illinois, Iowa, Indiana, Ohio and Missouri. Reported intentions of growers in all 10 main growing states on July 1 indicate that 11,500,000 acres of soybeans will be harvested for beans in 1943. This will be 7 percent more than were harvested for beans last year.

Near record crops are expected from this acreage, according to Crop Report predictions.

The 1942 crop brought in over \$300,000,000 to farmers, the harvest of 210 million bushels selling at \$1.60 a bushel. The guaranteed support price for the 1943 crop is \$1.80.

Have Many Uses

Soybeans have many uses, their variety being a principal reason for the crop's importance to the war effort. As a food for human consumption soybeans are rich in protein and carbohydrates, and contain other necessary ingredients for health. The average yield of food nutrients per acre of soybeans includes 1,545,000 calories, 339 pounds of protein, 176 pounds of fat, and 116 pounds of carbohydrates. Soybeans are a source of Vitamin A, thiamine, ascorbic acid, Niacin and riboflavin. They also contain calcium, phosphate and iron in considerable quantity.

Soybean oil is used as a cooking oil, as a shortening and as a margarine. One acre of soybeans equals about 155 pounds of cooking oil, the amount being determined by the yield. They may also be roasted and salted like peanuts. Soya flour has become widely used in baking and other cooking. Even a coffee substitute may be made from this versatile bean, as well as the soy sauce that was its best-known product for many years.

Livestock thrive on the soybean meal left after the oil is extracted. An important high-protein feed for cattle and other stock, it is particularly useful as a winter ration for young cattle, sheep, horses and mules and may be used to good advantage for hogs and poultry.

This same soybean meal is turned to a totally different use in the making of plastics, glue, casein, celluloid substitutes and other similar outlets.

Plastics offer great possibilities for expanding industrial use of soybeans. Plastic helmets, grips for pistols and handles for guns are but a few items being made from soybean plastic. Unusual resistance to heat and vibration has been found in plastic from soybeans used to house motors. Parts for airplanes and many other war weapons can be traced back to the farmer's bean field. And the war plant worker is thankful for plastic ear stoppers that cut out nerve-racking

machinery noises.

Glue from soybean meal is the only vegetable glue with sticking powers equal to those of animal glues and is used in making plywood. This appears in boats, planes and many other war uses. Its peacetime applications are manifold.

Soap and soap products are made from soybean oil. Glycerine, a by-product of soap manufacture, plays a vital role in producing nitro-glycerine for explosives. Soybeans yield nearly 9 pounds of crude oil to the bushel. Two pounds of soybean oil will make enough glycerine to fire 5 anti-tank shells. Last year more than 25 million pounds of soybean oil went into products that produce an 8 percent glycerine yield as a by-product.

Soybean oil as a substitute for linseed oil in paints and varnishes is receiving new application, with important recent developments in dehydration of the oil. The Navy is making good use of paint containing soybean oil in the form of a soybean alkyd synthetic, about 60 percent of the paint for a 10,000-ton cruiser, for example, being this type. About 30 percent by weight of that paint is soybean oil.

Soybean oil also is used in making linoleum, oil cloth, medicine, printing ink and synthetic rubber. Many parts for planes, tanks and other war machines employ this synthetic rubber, and it is finding an increasingly valuable application on the home front.

A soft, wool-like cloth has been developed from soybeans which can be manufactured at half the cost of sheep's wool materials. If wool shortages should arise, it is believed that clothes from soybean fiber could be used as a very satisfactory replacement.

Soybeans Are Adaptable

Soybeans are grown throughout the world in more than 2,000 varieties amenable to practically every climate suitable to vegetation. They are adapted to the use of large scale machinery which can be run by a small crew, and are shipped and stored in much the same manner as corn, wheat and other grains.

While soybeans are a comparatively easy crop to raise, they do best on level land where drainage erosion is at a minimum. They may be planted later than corn, although the cultivating problems of the two crops are similar as are the drill or broadcast methods of planting. Soybeans are harvested by combine. As soybeans and corn thrive in the same areas, the beans are sometimes planted in place of corn if rains interfere with getting in the earlier crop, since they can be seeded later.

Soybeans are a good emergency forage crop, and are particularly useful as a soil builder when plowed under.

Heavy planting of soybeans, especially by farmers to whom the crop was new, came about last year because of the great war need of soybean oil. Imports of fats and oils had been largely cut off by the conflict. Farmers were encouraged to try the unfamiliar planting because it was a war crop and they also

had the guarantee of a good price for their labors. In the corn belt, considerable acreage previously used for this grain was turned to soybeans because of the greater need. This year, however, most of such land has gone back into corn although the acreage of soybeans has been increased still further.

Varied reactions to the new crop have been found among farmers. Some liked it, others preferred the less "experimental" plantings. In general, except where weather conditions proved unsatisfactory or other problems contributed to an effort less successful than had been anticipated, soybeans have found favor among farmers.

America's post-war policy is expected to influence strongly the future of soybeans in this country. Industrialists say they can use greatly increased quantities of soybean oil, and that permanent commercial plants for utilization of soybeans in new ways only now coming to the fore will be an outgrowth of the war. If imports of fats and oils go back to their pre-war level, or higher, the need for domestic beans for this purpose will drop. If steps are taken to curtail such imports, demand will remain at its present level or might even show an increase.

Industrial uses of soybean oil are so varied, however, that future development might provide a market for imports and the domestic production as well.

The importance of soybean meal as a protein feed, and a general source of protein, might possibly keep the value of soybeans as a crop at a high level, experts believe, even if the oil price went down. The field of plastics will undoubtedly play an influential role in post-war soybean utilization.

With the tremendous increase in the use of soya flour in combination with wheat flour for human consumption, and of other soybean products as extenders in various foodstuffs, indications are that the next fiscal year will see the milling of about 35 million bushels of beans for oil and low-fat flour, and full flour. In many quarters it is believed that soybean flour stands an excellent chance of "outrunning" plastics as a post-war use for this farm crop.
